A Landowner's Guide for Restoring

Central Ontario's Rice Lake Plains Tallgrass Prairie

Second edition produced by the Peterborough County Stewardship Council and the Nature Conservancy of Canada through the Rice Lake Plains Joint Initiative.

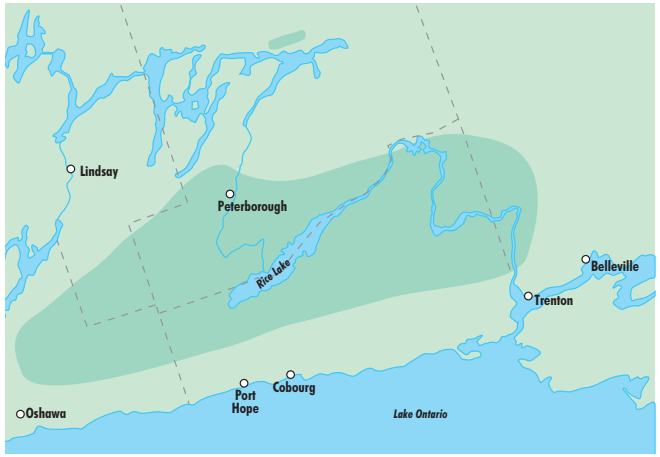
Introduction

In 1832, Catharine Parr Traill painted a picture with words when she described the Rice Lake Plains as an azure sea, brilliant with the blues of wild lupines. Nearly two centuries since Parr Traill's time, only a remnant of the tallgrass prairie and oak savanna she captured with words remains. The Rice Lake Plains, located on the eastern flanks of the Oak Ridges Moraine (see map) supports one of the rarest ecological communities in North America. Today, less than 1% remains of Ontario's tallgrass prairie habitat. The landscape that was once so abundant has all but completely disappeared.

Encompassing nearly 100,000 acres (40,470 ha), the Rice Lake Plains natural area lies within the rolling hills that rise northward from Lake Ontario's shoreline to the Rice Lake area. In small protected and forgotten corners of the region you can still find tallgrass prairie species such as Big Bluestem, Indian Grass, Prairie Buttercup and Switchgrass growing higher than two metres and bold prairie wildflowers like Cylindrical Blazing Star and Wood Lilly blossoming in late spring and summer. Where you find such plants you will likely also see grassland bird species, such as Grassland Sparrows and Eastern Meadowlarks, species whose populations are in rapid decline.

There is a great opportunity for landowners in the Rice Lake Plains region to take part in the preservation of the remaining tallgrass prairie and Black Oak savanna habitat. This guide is intended to help you create and steward your native prairie and savanna habitat and is specifically designed for residents of Hastings, Northumberland, Peterborough, and Victoria counties and the Region of Durham. If you wish to restore more than one acre you should contact a conservation organization in your region for further guidance.

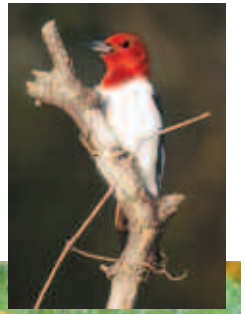
General vicinity of Rice Lake Plains Tallgrass Prairie



A Brief History of the Tallgrass Prairie Ecosystem in Central Ontario

Ojibway people have been at Rice Lake since about 1700. According to Rick Beaver, Alderville First Nation, the Mississauga arrived in Alnwick Township, on the south side of Rice Lake, during the 1830s from the Bay of Quinte area. Local indigenous people understand the rich biodiversity of prairie lands and the dependence upon fire for regeneration and life. Native peoples named Rice Lake, Pemedashdakota and Pemedashcoutayang meaning, "Lake of the Burning Plains". Intentional and natural fires have for centuries been used as a management tool to keep encroaching trees and shrubs at bay, preserving the open tallgrass prairie lands until the arrival of Europeans. Agriculture and other forms of rural development and management, including the restriction of natural fires, lead to the demise of most of Ontario's, and North America's, prairie and savanna habitat and species, including birds, butterflies, reptiles and mammals.

Three prairie types exist in North America, namely the shortgrass, mixed grass and tallgrass prairies. These names refer to the height of the predominate grasses in each plant community. Central Ontario is considered the northeastern limit for suitable growing conditions for tallgrass prairie. Temperatures are cooler and moisture more plentiful, favouring the development of trees. Only in a few areas with dry, sandy soils are the conditions suitable for prairies. On these special sites, Big Bluestem, Indian Grass and Switchgrass may establish. In addition to these large grasses, local prairies typically contain a mixture of drought tolerant forbs or wildflowers, shrubs and lesser known grasses. Black oak savanna habitat refers to the large open spaces dotted by oak species that usually exist alongside prairies.



Today, Alderville First Nation's Black Oak Savanna and Tallgrass Prairie remains one of the best examples of prairie and savanna habitat left in central Ontario.

Butterfly Weed

Benefits of Restoring the Rice Lake Plains Tallgrass Prairie…

The tallgrass prairie remnants on the Rice Lake Plains are, in many places, too fragmented to support the full range of wildlife species it once did. However, many provincially and nationally rare plant species still grow here and their unique gene pools, preserved in the seed bed, should be conserved for their ecological, economic and social values. You can help genetic diversity carry on by restoring remnants and creating new prairie on your land. In addition to conservation purposes, prairie restoration has many practical advantages. Prairie plants are:

- excellent soil stabilizers
- drought resistant
- easily maintained, once established requires periodic maintenance
- aesthetically pleasing


Indian Grass


Planting plugs at a prepared site

Grassland birds need help!

Populations of grassland birds such as Grasshopper Sparrows, Bobolinks and Eastern Meadowlarks have declined dramatically across North America due to the loss, fragmentation and degradation of grassland habitats. But, there is hope as research indicates active management and restoration are effective forces in preventing further losses. There are many resources available for landowners interested in restoring habitat with birds in mind. Talk to field staff from the Nature Conservancy of Canada, Wildlife Habitat Canada's Wetland Habitat Fund and other conservation groups for more information.

Grassland/savanna species: Red-headed Woodpecker, Bobolink, Eastern Kingbird, Eastern Meadowlark, Grasshopper Sparrow, Northern Harrier, Savannah Sparrow, Short-eared Owl, and Vesper Sparrow

Before You Decide...

If you are considering restoring a prairie remnant on your property, first take the time to visit a restoration site in your region. The Alderville Black Oak Savanna, located within the Alderville First Nation, the Rainbow Cottages Resort, south of Peterborough, the Goodrich Loomis Conservation Area, north of Brighton, and Peterborough Green-Up's Ecology Park in the City of Peterborough, are great examples of what can be achieved through a commitment to land stewardship. While the methods described in this guide have worked well locally, it is important to remember that each site is unique and the process of re-establishing prairie is a new and inexact science. The more prairie sites you visit the more tools you will have to better your restoration project. Restoring tallgrass prairie remnant on the Rice Lake Plains presents local landowners with opportunities to foster flora and fauna that traditionally belong on the land.

Land Protection Tool Box

There are many options designed to help landowners conserve the natural features that make their land ecologically significant, such as wildlife habitat or unique plant communities. Increasingly, landowners are employing tools from the conservation tool box to determine what the future holds for their property. Here are a few of the options available today:

Fee simple donations – private owners may transfer their property to a charitable organization, such as a land trust, for conservation purposes. Tax benefits may be available for the donor.

Conservation easement agreements – a legally binding agreement between a landowner and a conservation organization to preserve ecologically significant lands; once registered it binds future owners. The agreement sets out restrictions on activities that would threaten the natural value of the land. An easement allows the owner to remain on the land while ensuring its protection from future development. The owner can keep the land in the family, sell it, or donate it whenever he or she chooses. Each agreement is customized to suit that particular piece of property, and the federal government offers a tax incentive for protecting the land (provided it meets certain ecological criteria).

Sales at less than fair market value: if made to a qualified charitable organization or government entity, such a sale can also result in a tax benefit to the property owner based on the difference between the appraised value and the actual sale price provided certain criteria are met.

All of the tools listed above have important legal and tax implications. Landowners should get independent legal and tax advice at an early stage of any discussion that might result in a transaction affecting their land. Conservation organizations are happy to assist landowners to understand what questions they should be asking their professional advisors.


Wild Lupine

Site Selection

Consider the following points when selecting a site for your prairie:

• Soil Requirements

Since prairie plants are drought tolerant, sandy, well drained soils are preferred. Contact your local Conservation Authority or Stewardship Council for assistance in determining your soil type and condition.

• Slope/Orientation

Prairies grow best on level to gently sloping terrain that faces south, south east or south west.

• Shade Tolerance

Prairies prefer 70-100% full sun. Choose a site that is not overly shaded by trees, hills or large buildings.

• Moisture Regime

Preferred sites are well drained areas that do not hold water following heavy rains.

Prairie Smoke

Blue-eyed Grass

Switchgrass

• Past Usage

If you are planting on retired agricultural land, investigate previous farm practices as some herbicides may linger in the soil for two or three growing seasons. These residual chemicals could hinder germination and early plant development.

Big Bluestem

• Clearance From Buildings, Lot Lines and Utility Corridors

Part of the long term management of your prairie may involve prescribed burns. Try to leave a 10 metre safety margin (fire break) around buildings and lot lines. This buffer will also protect your prairie from spraying or fertilizing that may occur on neighbouring lands.

Site Preparation

Site preparation is the single most important factor when it comes to restoring prairie. The objective of site preparation is to eliminate competing and dormant weed seeds in the soil. It is strongly recommended that you dedicate your first growing year to soil preparation. No till and tilling the soil are two popular methods.

No Tilling Methods

The advantage of no tilling methods is that they do not expose the weed seed banks that lie within the soil.

Using Herbicides

It is possible to eliminate existing turf or weed cover by spraying herbicides containing glyphosate (such as Round Up) on your plot two or three times during the growing season (March to November). Round Up is a popular non-lingering herbicide. Spraying is most effective when applied when weeds are growing vigorously (just as the flower heads are developing). Do not allow weeds to develop seeds. Chemicals other than Round-Up may be used for this purpose but will require a licensed applicator to apply them. Do not use any chemical unless certain it will not linger in the soil and prevent the successful growth of your prairie species.

Use chemicals carefully, as they can be harmful to you, other people, pets, wildlife and other vegetation. Carefully follow the manufacturer's instructions and wear protective clothing. Use a licensed herbicide application firm if you are unfamiliar with herbicide use.

Apply Plastic Coverings

Lay a black plastic tarp over your site for a full growing season. Peg the tarp tightly to the ground, on all sides, to prevent air circulation. The plastic smothers the weeds and the heat build-up can kill seeds and sprouts. This method is less successful than chemical weed control as some species such as crab grass may not be completely eliminated.

Prairie Dominoes

Native prairie species, like Big Bluestem and Wild Lupine, have to compete against aggressive non-native and invasive plants for growing space. There is a domino effect that occurs when land use decisions fail to consider negative impacts, even small ones, which have big consequences for prairie habitats over time. This domino effect can begin with simple alterations to the land over time. Disturbances, such as those caused by motorized vehicles, including All Terrain Vehicles (ATV's), grazing animals or planting non-natives species, are enough to give invasive species such as Dog Strangling Vine and Sweet White Clover an advantage over native plants. Given what may seem like a small advantage these plants take root and begin colonizing the area and the number of prairie species declines.

Tilling the Soil

In the spring, use a rototiller to work up a patch of lawn or turf. A former garden or worked field will also provide you with the bare soil needed. Over the course of a growing season let natural growth occur. As the weeds mature, kill them off through successive episodes of cultivation (hoeing or rototilling) and/or the application of a glyphosate herbicide.

Practicing either no till or tilling treatments for one or more growing seasons should adequately prepare the soil for planting the following spring.


Black-eyed Susans

Additional Site Preparation Tips

- Watch your plot closely. Whether using the tilling or no-tilling technique, never allow weeds to go to seed prior to cultivating or spraying.
- Before planting, remove any accumulated dead vegetation.
- Do not add compost or manure to your plot. Tallgrass prairies are adapted to nutrient poor soils. Increasing soil fertility will only benefit non-prairie species.
- If you are planning paths through your plot, lay down your walkways prior to planting.

Species Selection

Keep your prairie simple at first by starting with a small number of grasses (2 to 4) and about half a dozen forbs (wildflowers) that will add some colour to your young prairie throughout the growing season. The fewer species you start with, the fewer you will have to recognize in their various states of growth and the less weeding you will have to do! Be sure to select species that are representative of the original Rice Lake Plains prairie.

Are Your Seeds Local?

A critical step to restoring prairie habitat is the use of local seed stock. When sourcing seeds and plugs make sure you know exactly where the seed stock is coming from. Planting seeds from sources outside of your neighbourhood introduces new genetic material and new plants that are not adapted to your region. Non native plants have the potential to become invasive and out-compete native plants that are specifically adapted to the region. This can undermine your attempts at protecting native tallgrass habitats.


Showy Tick Trefoil


Prairie Smoke


Wild Bergamot


Smooth Beardtongue

COMMON NAME	BOTANICAL NAME	TYPE / FLOWER PERIOD
GRASSES		
Big Bluestem	Andropogon gerardii	Warm season
Indian Grass	Sorghastrum nutans	Warm season
Little Bluestem	Schizachyrium scoparium	Warm season
Canada Wild Rye	Elymus canadensis	Cool season
Slender Wheat Grass	Elymus trachycaulus	Cool season
Prairie Brome	Bromus kalmii	Cool season
Switchgrass	Panicum virgatum	Warm season
Side Oats Gamma	Bouteloua curtipendula	Warm season
Sand Drop Seed	Sporobolus cryptandrus	Warm Season
FORBS/WILDFLOWERS		
Butterfly Milkweed	Asclepias tuberosa	June July August
Long Headed Thimbleweed	Anemone cylindrica	June July
Thimbleweed	Anemone virginiana	July August
Round Headed Bush Clover	Lespedeza capitata	August September
Cylindrical Blazing Star	Liatris cylindracea	August September
Wild Bergamot	Monarda fistulosa	July August
Black Eyed Susan	Rudbeckia hirta	July August
Showy Tick Trefoil	Desmodium canadense	July August
Wood Lily	Lilium philadelphicum	June July
Wild Lupine	Lupinus perennis	April May June
Early (Prairie) Buttercup	Ranunculus fascicularis	April May
Hoary Vervain	Verbena stricta	July August September
Tall Cinquefoil	Potentilla arguta	June July August
Hairy Beardtongue	Penstemon hirsutus	June July
Smooth Beardtongue	Penstemon digitalis	June July
Prairie Smoke	Geum triflorum	April May June
Sunflower	Helianthus several varieties	August Sept October
Heath Aster	Aster ericoides	August Sept October
Sky Blue Aster	Aster oolentangiensis	September
Smooth Aster	Aster laevis	August September October
Frost Aster	Aster pilosus	September - November
New England Aster	Aster novae-angliae	September October
Arrow Leafed Violet	Viola sagittata	April to June
Virginia Mountain Mint	Pycnanthemum virginianum	July to September
Groved Yellow Flax	Linum sulcatum	July August
Stiff Gentian	Gentiana quinquefolia	August to October
Fringed Gentian	Gentianopsis crinita	Sept October
Blue-eyed Grass	Sisyrinchium montanum	June July
Spreading Dogbane	Apocynum androsaemifolium	June to August
Sneezeweed	Helenium autumnale	August, September
Daisy Fleabane	Erigeron annuus	June to October
Flattop Aster	Aster umbellatus	September
Fireweed	Epilobium ciliatum	June to September
Canada Goldenrod	Solidago canadensis	September
Flattopped Goldenrod	Solidago graminifolia	September
Indian Paintbrush	Castilleja coccinea	August September
Prairie Buttercup	Ranunculus rhomboideus	April to June
SHRUBS		
Pasture Rose	Rosa carolina	June July
New Jersey Tea	Ceanothus americanus, herbaceous	May June July
Fragrant Sumac	Rhus aromatica	May June July
Evergreen Bearberry	Arctostaphylos uva-ursi	May June
Upland Willow	Salix humilis	April May
Gray Dogwood	Cornus racemosa	May June
Lowbush Blueberry	Vaccinium augustifolium	June to August
TREES		
White Pine	Pinus strobus	NA
Black Oak	Quercus velutina	NA
White Oak	Quercus alba	

Propagation and Planting Options

Use plugs instead of broadcasting or drilling seeds for small plots. While this method is more labour intensive, it will provide you with more immediate results. You can purchase plugs or grow your own from seed.

If you decide to start your own prairie plants, start your seeds in the same manner that you would start other garden plants. Use a soil-free starting mix blended with 50% sand. Planting trays that have individual cells 10 cm deep are preferred as prairie plants have fast growing and deeply penetrating roots. If trays of this depth are not available, transplant the plugs early to avoid root damage. Water in the range of pH 6-6.5 is ideal for germination and if you are using treated tap water, let it sit for at least twelve hours to allow chlorine to dissipate.

The plugs should be started in early March in a bright, frost-free environment. The plugs should be acclimatized to outside growing conditions by moving them to a shady spot four to five days prior to transplanting. This process, referred to as hardening off, reduces the likelihood of transplant shock.

Preferred seeding and planting dates for grasses and forbs ranges from mid May to mid June. Local experience has also shown success seeding forbs in the fall. Planting plugs or seeding grass in the fall has shown limited success.

If you are restoring a plot in the one acre (0.5 ha) range or greater you will require a sizeable investment in seed and may wish to contract an experienced grower to start your plants. Improved germination, greater plant vigour and reduced labour usually offset the extra cost.

Transplanted plug

Planning Your Plot

A rule of thumb is to plant 6-12 plugs per square metre, depending on the species. This results in good ground coverage when the plants mature. Let your own tastes direct the preferred layout. Do consider that big bluestem can reach heights of 3 metres and Indian grass up to 2 metres. Place them in the rear of your plot and locate the smaller wildflowers near the front. Also consider areas for walkways to access the interior of your plot.

Native shrubs, as noted on the species list, may be used to mark border areas or to add contrast to the interior of your plot. White Pine and Black Oak are the two tree types most often associated with local prairies. If these tree species occur on your property, the aesthetics of your prairie garden may be enhanced by associating your plot with them.


Soil Testing


Showy masses of Bergamont


Prairie Buttercup

Management and Maintenance

Early Management

Watering may be required in the first year to keep the young plants alive during drought periods. After the first year, it is not usually necessary to water plants.

Tending

If your plot becomes infested with weeds shortly after seeding or transplanting, you have three alternatives:

- **Hand Pulling:** Learn to recognize Dog Strangling Vine, Foxtail, Horseweed, Lambs Quarter, White Sweet Clover, Ox-eyed Daisy, Pigweed, Wild Carrot, Canada Thistle, Spotted Knapweed, Mustard, Quack grass and other exotics. They are aggressive, invasive weeds and may out-compete young prairie plants. Also remove non-native grasses such as Orchard Grass and Timothy.

- **Spraying:** If your plot is small, you can place containers over each plug and spray the plot with Round-Up.

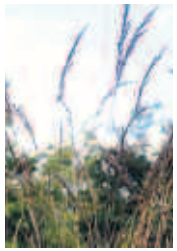
- **Mowing:** If your plot is too large to manage by hand pulling or spraying, you can use a lawn mower to mow the plot at about 15 cm height. Mow before the weeds go to seed and repeat if necessary during the summer.

Long Term Management

Prescribed burns should be considered as one option in the long-term management of unwanted weeds, shrubs and trees. Familiarize yourself with your municipality's by-laws regarding open fires and obtain permits where required. It is recommended that you contact Tallgrass Ontario or the Ministry of Natural Resources before proceeding with a prescribed burn on your plot. Always use extreme caution and common sense when carrying out your burn. Other options instead of fire include mowing right at ground level to emulate natural disturbances.

Diversifying Your Prairie

Diversify your prairie by adding new species over time. This can be done by transplanting plugs or broadcasting seed into areas of barren soil. If broadcasting, rake the seed into the soil or take advantage of late winter freeze-thaw cycles to work the seed in naturally.



A Word About Remnant Patches

As you become familiar with native prairie species, you will become aware of naturally occurring remnant patches in your region. Look along roadsides, railway rights-of-way, in old cemeteries or on abandoned lands for prairie species. Tall, richly coloured grasses in small clumps or large patches will draw your attention. Please treat these valiant survivors with respect. They hold the genetic blueprints for restoring prairie throughout the area. Do not attempt to transplant grasses or forbs to your property. Many species, such as butterfly milkweed and wild lupine will die if transplanted. Seed collection is strongly discouraged and should be done only as a part of an effort organized by a stewardship council, conservation authority or naturalist group following guidelines prepared by the Society of Ecological Restoration (SER)*.

Fortunately by working together, we have a rare opportunity to restore these prairie and savanna remnants in this globally significant habitat range. Many landowners, organizations and municipalities are working together to protect what remains. The Rice Lake Plains Joint Initiative is comprised of the Nature Conservancy of Canada, The County of Northumberland, Ganaraska Region Conservation Authority, Lower Trent Conservation, Ontario Parks and Wildlife Habitat Canada/Wetland Habitat Fund, funded by the Oak Ridges Moraine Foundation, illustrates the spirit of partnership that is growing on the Rice Lake Plains.

Sources of Information and Assistance

STEWARDSHIP COUNCILS		www.ontariostewardship.org
Peterborough County	705-755-1951	
Northumberland County	705-755-3298	
Victoria County	705-324-1478	
Durham Region	905-713-7375	
CONSERVATION AUTHORITIES		**www.conservation-ontario.on.ca**
Kawartha Conservation	705-328-2271	www.kawarthaconservation.com
Lower Trent Conservation	613-394-4829	www.ltc.on.ca
Ganaraska Region Conservation	905-885-8173	www.grca.on.ca
Otonabee Conservation	705-745-5791	www.otonabee.com
PUBLIC AND NON-PROFIT ORGANIZATIONS		
Alderville First Nation	905-352-2011	www.aldervillesavanna.ca
Peterborough Green-Up, Ecology Garden	705-745-3238	www.greenup.on.ca
Society for Ecological Restoration (ON Chapter)	705-748-1634	www.serontario.org
Tallgrass Ontario	519-873-4631	www.tallgrassontario.org
Ontario Ministry of Natural Resources	1-800-667-1940	www.mnr.gov.on.ca
Ontario Nature	1-800-440-2366	www.ontarionature.org
Ontario Parks	1-800-667-1940	www.ontarioparks.com
Nature Conservancy of Canada	1-800-249-9598	www.natureconservancy.ca
Natural Heritage Information Centre (NHIC)	705-755-2159	www.mnr.gov.on.ca/mnr/nhic
Oak Ridges Moraine Foundation	905-833-5733	www.ormf.com
Wetland Habitat Fund/Wildlife Habitat Canada	705-743-5327	www.wetlandfund.com
INFORMATION ON RESOURCES AND PROGRAMS		
All Birds All Habitat	705-743-5327	www.wetlandfund.com
Native Plant Resource Guide		www.serontario.org/publica.htm
Ontario Land Trust Alliance	613-284-4646	www.ontariolandtrustalliance.org
The Black Oak Savanna/Tallgrass Prairie of Alderville First Nation		www.rickbeaver.com

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Nature Conservancy Canada

Oak Ridges Moraine Foundation